Date: 8/1/03

To: Fire Chief Morris, Andrew Lofton, City of Seattle

From: David Solet, PhD, Assistant Chief, Epidemiology, Planning and Evaluation Unit

Re: Evaluation of cancer concerns in Fire Station 31

Last week, Public Health – Seattle and King County was asked to evaluate the public health significance of reported cancers in people who have worked in Fire Station 31. Assistant Chief Tipler provided Dr. Plough with a list of people who had been diagnosed with cancer and other health problems, including people with non-malignant brain tumor, alopecia and ALS (assumed to be Amyotrophic Lateral Sclerosis), which were gathered from fire station logs, and Dr. Plough passed them on to me. Except for alopecia, which included two cases, the non-cancer health problems included one case of each. Because I either did not consider them to be major health concerns compared to cancer or because they were few in number—as well as the request that we provide this evaluation as quickly as possible—these non-cancer health problems are not discussed here. We are also not including a discussion of the risk of cancer and other health problems in firefighting as an occupation, because the focus is concern about the fire station building. As you know, there is an extensive literature on occupational risk to firefighters; I would be happy to make that available if needed.

The information on the people with cancer included dates assigned to the fire station, type of cancer, whether employment status was active or retired and date of retirement. Assistant Chief Tipler mentioned that these cancers had occurred in the last 12 years. Age, race, gender and date of diagnosis were not available, and personal identifying information was also omitted. The discussion and recommendation below is limited by the lack of this and other kinds of information, and if new information arose it may need to be re-evaluated.

It is important to acknowledge that cancer is a personal tragedy for the victims and their families, friends and co-workers. What follows is our scientific interpretation of the information provided and is certainly not meant as a response to these legitimate and deeply felt emotions.

The information provided to us did not cause alarm. Eight cancer cases were listed, including three lung cancers, and one each of cancer of the brain, breast , esophagus, pancreas and skin (melanoma). Lung cancer is the third most common cancer in King County (12 percent of new cases), so seeing three cases here did not seem unusual. Nine of 10 lung cancers occur in smokers and ex-smokers, and knowing tobacco use history in these individuals would be another useful piece of information. The other cancer types (one case each) do not cause concern because known or suspected causes are different for the different types. For instance:

- Exposure to ultraviolet radiation from the sun, white skin color and fair skin type result in elevated risk of melanoma.
- Family history, age at first birth and age at menopause, and overweight/obesity are confirmed risk factors for breast cancer.

- There is some evidence that some types of brain cancer may be associated with exposure to ionizing radiation, solvents or electromagnetic fields.[1]

Generally, cancer clusters involving one or closely related types of cancer tend to raise our level of concern about a common cause. For instance, if seven of the eight cancer cases were brain cancer, we would be far more concerned, but the range of cancer types reported here means we are probably dealing with unrelated diseases.

Cancer is more common than many people realize. Cancer is the leading cause of death in King County residents and accounted for one in four deaths in 2001. One in three Americans will get cancer in their lifetimes, and cancer will affect three out of four families. Most types of cancer occur far more commonly in older people, so the fact that six of the eight cancers reported were in retired workers also tends to lessen our concern. [2]

We were asked whether we would recommend additional epidemiological study at this time. The need for further study needs to be considered in light of the existing evidence, the substantial expense and resources it would involve, the time it would take and, perhaps most importantly, the chance that a study would provide new knowledge to fire department staff and officials that would help assess any potential hazards of Fire Station 31. The relatively small numbers of cancers that would occur in people in a single fire station might allow an investigator to rule out a very large increased risk, but would throw no new light on the smaller environmental risks that are being considered here. Even if there was increased risk, cancer that occurs now is mostly likely due to exposures that have occurred 10 to 30 years in the past. On this basis, we do not recommend any further epidemiological study at this time. We do support additional industrial hygiene evaluation of the station, which would turn up any currently existing hazards.

There are some limitations to these findings. For instance, there is little information on demographic characteristics (e.g., age, race, gender) or individual behavioral risks like tobacco use, that dramatically affect the chance of contracting some cancers. For instance, if age at diagnosis for the lung cancers was young, we might have more concern about a potential public health problem. (However, this is unlikely since the lung cancers occurred in retired firefighters.) We are also assuming that the cancer types provided are the correct primary (originally diagnosed) types. For instance, lung cancer can metastasize to the brain and might have been reported in the logs as brain cancer. The only way to know for sure is to gain access to the medical records or case information in the Washington State Cancer Registry, which has collected all cancer reports since 1992. Also, we are assuming this is a complete or nearly complete list of cancers that have occurred in Fire Station 31 personnel over the last 12 years. If other cancers became known and changed the patterns observed here, the new information would need to be evaluated.

Please let me know if you have any questions or if we can provide any further information.

cc: Alonzo Plough, PhD, MPH

---

[1] Adami H-O, Hunter D and Trichopoulos D, Editors (2002): Textbook of Cancer Epidemiology, Oxford University Press, New York, NY (Part II: Cancer Epidemiology by Site-Specific Cancers, sections on site-specific risk factors.)

[2] Some information in this paragraph was adapted from *Cancer Facts and Cancer Clusters*, a draft publication provided by the Washington State Department of Health.